| 1998/1999 SUCCESS STORIES |

CIPEC

anadian industry program for

energy conservation

Natural Resources Canada
Office of Energy Efficiency

Ressources naturelles Canada
Office de l'efficacité énergétique

Canada

OEE

Office of Energy Efficiency
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Leading Canadians to Energy Efficiency at Home, at Work and on the Road

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INNOVATION in action

As the Canadian Industry Program for Energy Conservation (CIPEC) gears up to celebrate its 25th anniversary of volunteer cooperation between the federal government and Canada's manufacturing and mining industries, we invite you to read about the efforts of 11 CIPEC participants who have substantially reduced the energy intensity of their operations.

The approaches and successes exhibited by these forward-looking organizations are only a representative sample of the impressive energy efficiency improvement results being achieved across Canada through the voluntary efforts of Canadian industry. CIPEC participants, such as the companies featured here, demonstrate day in and day out that hundreds of companies taking individual action can have a substantial, positive impact on our environment and make a vital contribution to Canada's success in meeting its international commitments.

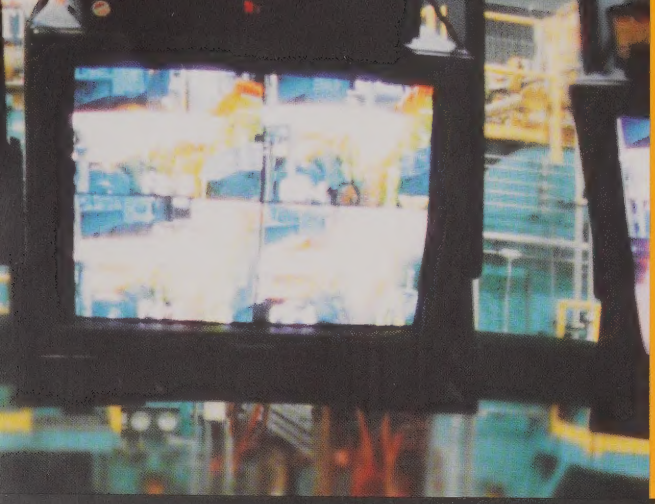
Equally important, investments and efforts designed to improve energy efficiency have also helped participating companies reduce costs and improve profitability—vital components of every successful enterprise's business strategy. Their achievements demonstrate that responsible environmental action can significantly improve the bottom line.

Since 1990, companies participating in CIPEC have made important voluntary contributions toward our nation's goals of decreasing energy intensity and reducing the production of greenhouse gases. Between 1990 and 1997, Canada's mining and manufacturing companies improved their average annual energy intensity by 0.9%. Since 1990, despite a strongly expanding economy, better use of energy has enabled these companies to limit related carbon dioxide emissions to a marginal increase of less than 0.5%. No other sector of the Canadian economy can lay claim to such results.

Providing a role model for government-business partnerships in Canada, CIPEC continues to be the focal point for the manufacturing and mining response to Canada's National Action Program on Climate Change. CIPEC is also building an international reputation and regularly fields inquiries from governments, business and industry around the world.

Peter Cooke
Executive Vice-President, Lafarge Canada Inc. and
Chair, CIPEC Executive Board


ALGOMA STEEL INC.
New complex nets
major



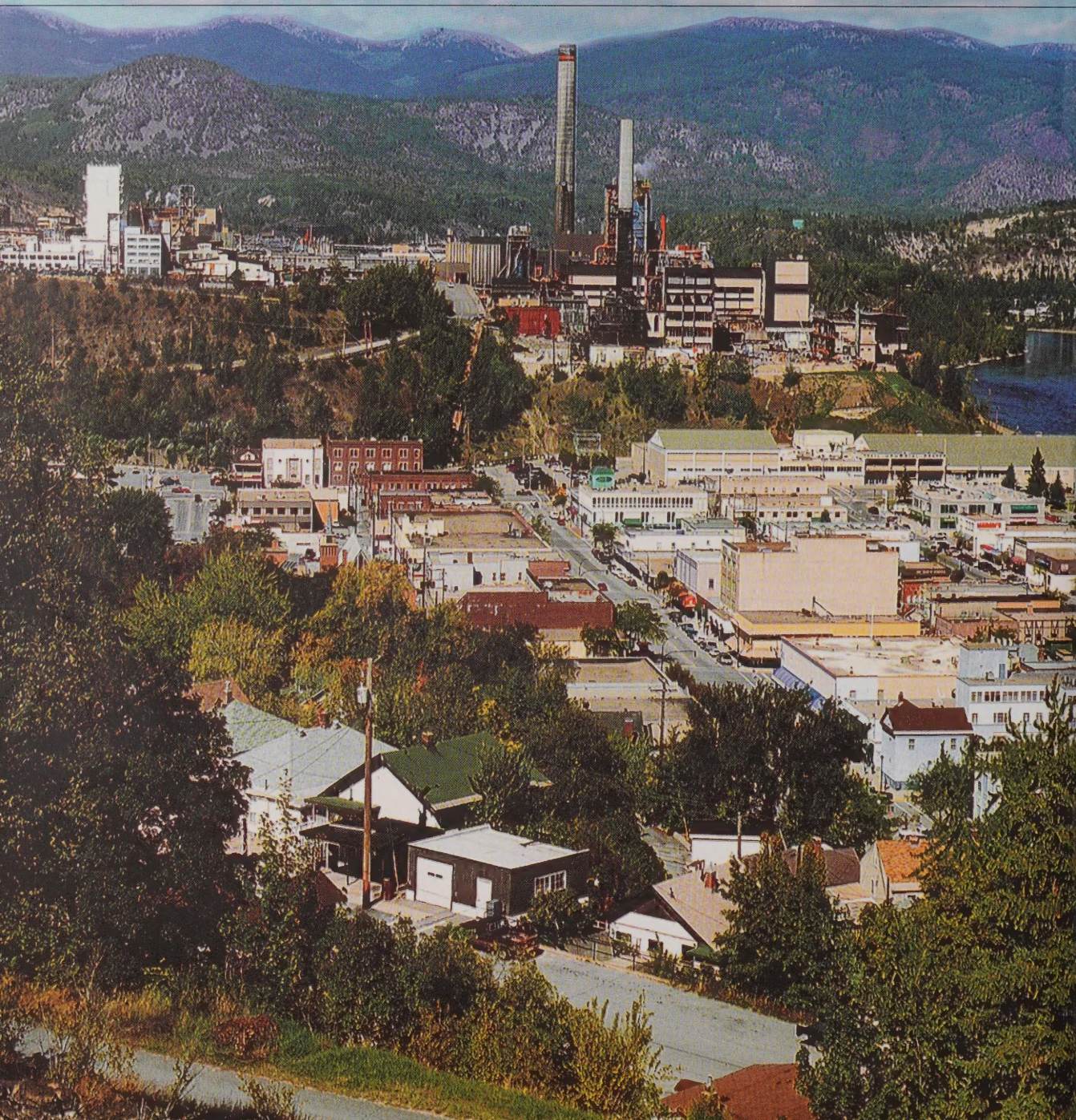
The new Direct Strip Production Complex at Algoma Steel Inc. has raised the industry's energy efficiency bar.

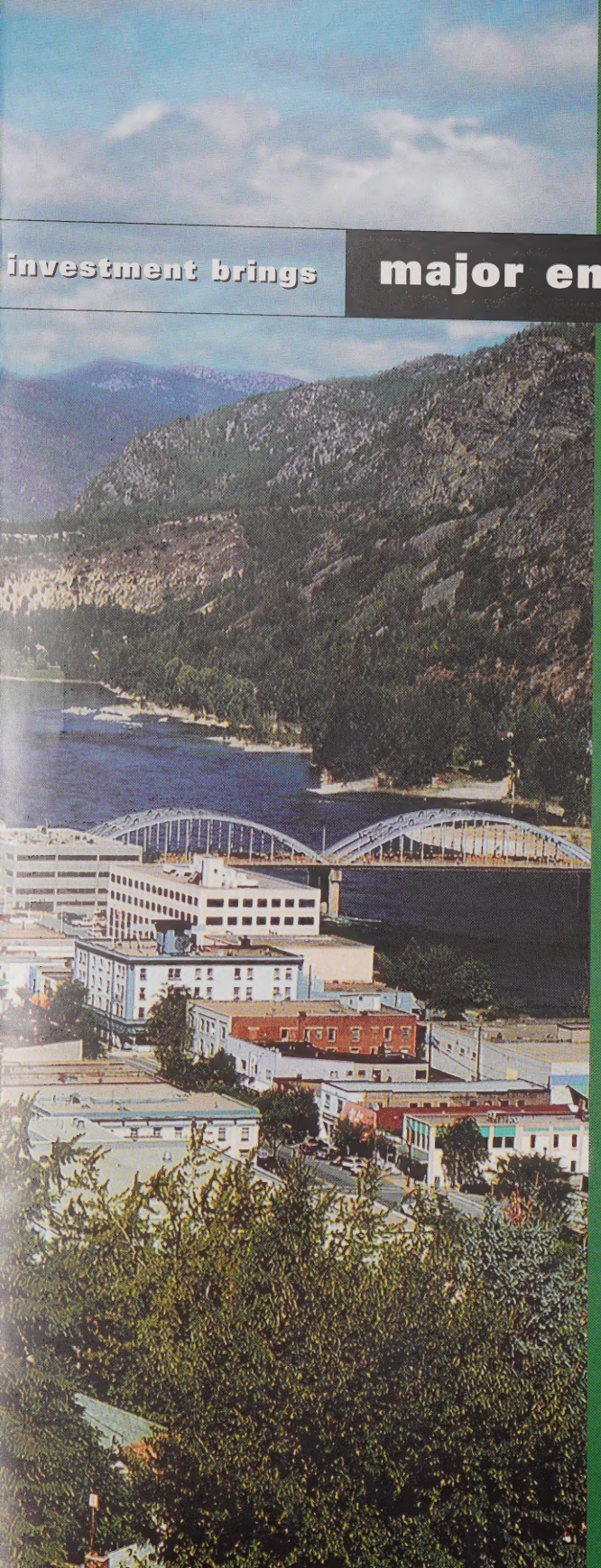
Conventional rolled steel production begins with the conversion of melted steel into thick, 200-mm to 300-mm slabs. The slabs are cooled and transported to rolling mills where they are reheated to high temperatures, then progressively rolled to the desired thickness. Heat loss is high and large quantities of energy are needed to complete the process.

nergy efficiency and product quality gains

Algoma's direct strip production process begins by casting 230-tonne ladles of steel into 70-mm slabs—thinner material that is more easily rolled to finished dimensions. The newly formed slabs, which are still at nearly 1000°C, are further heated to 1200°C. In one pass through the roughing mill, they are descaled, edged and rolled to 35 mm. Measures built into the finishing mill to maintain exact temperatures enable final rolling and cooling at precisely controlled, uniform speeds. The process produces finished coil from liquid steel in less than 15 minutes, while ensuring consistent physical properties and precise gauge from one end of the roll to the other. Final product thickness is from 1 mm to 15 mm.

By closely linking the casting and rolling processes, Algoma conserves energy while enhancing production efficiency. From virgin materials to finished coils, Algoma Steel's new production complex is built around energy efficiency and now produces some of North America's highest quality, lowest cost steel coil.





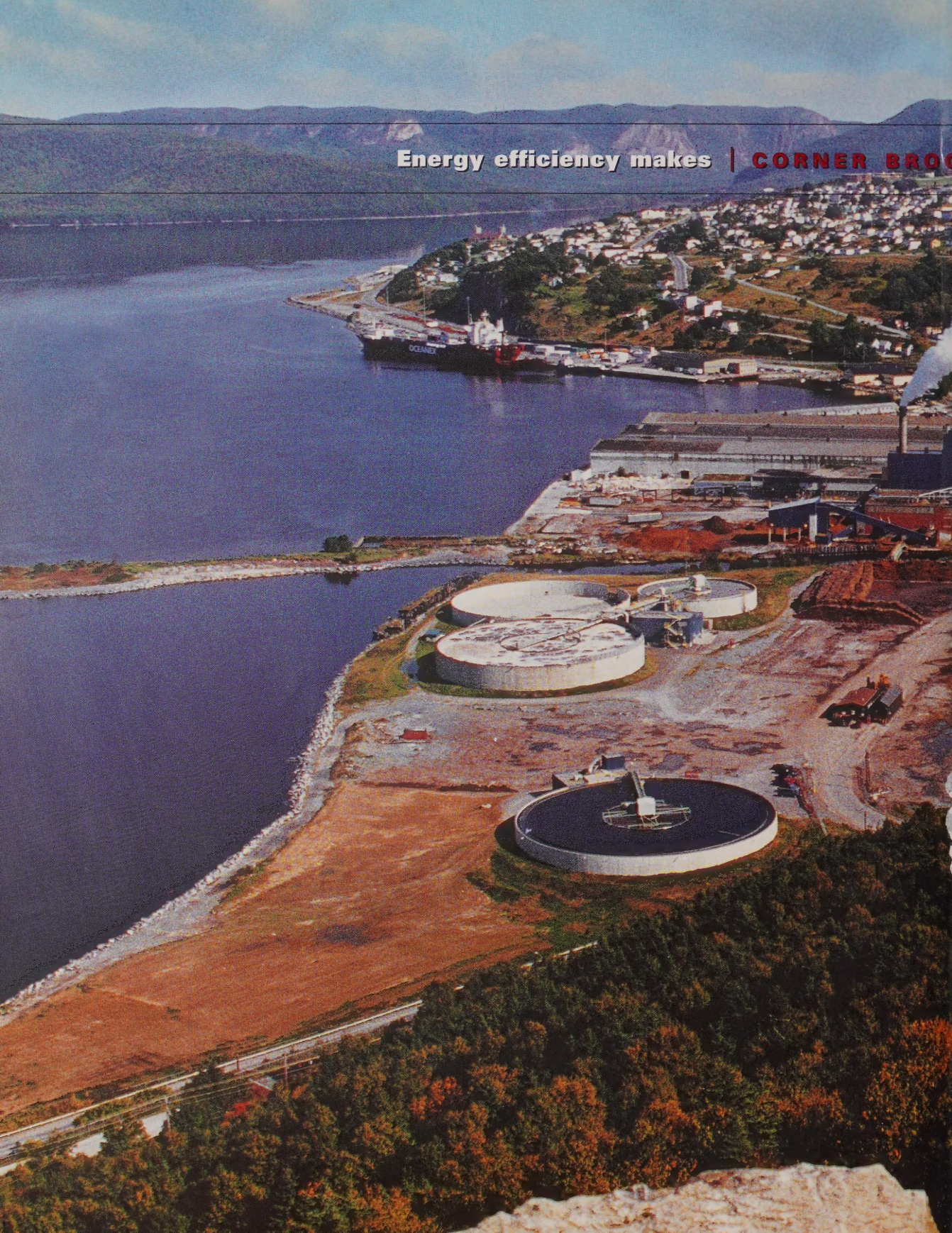
An investment of several hundred million dollars over the past two decades has enabled Cominco Ltd. to modernize its mining technology and significantly reduce carbon fuel intensity at its facility in Trail, B.C.

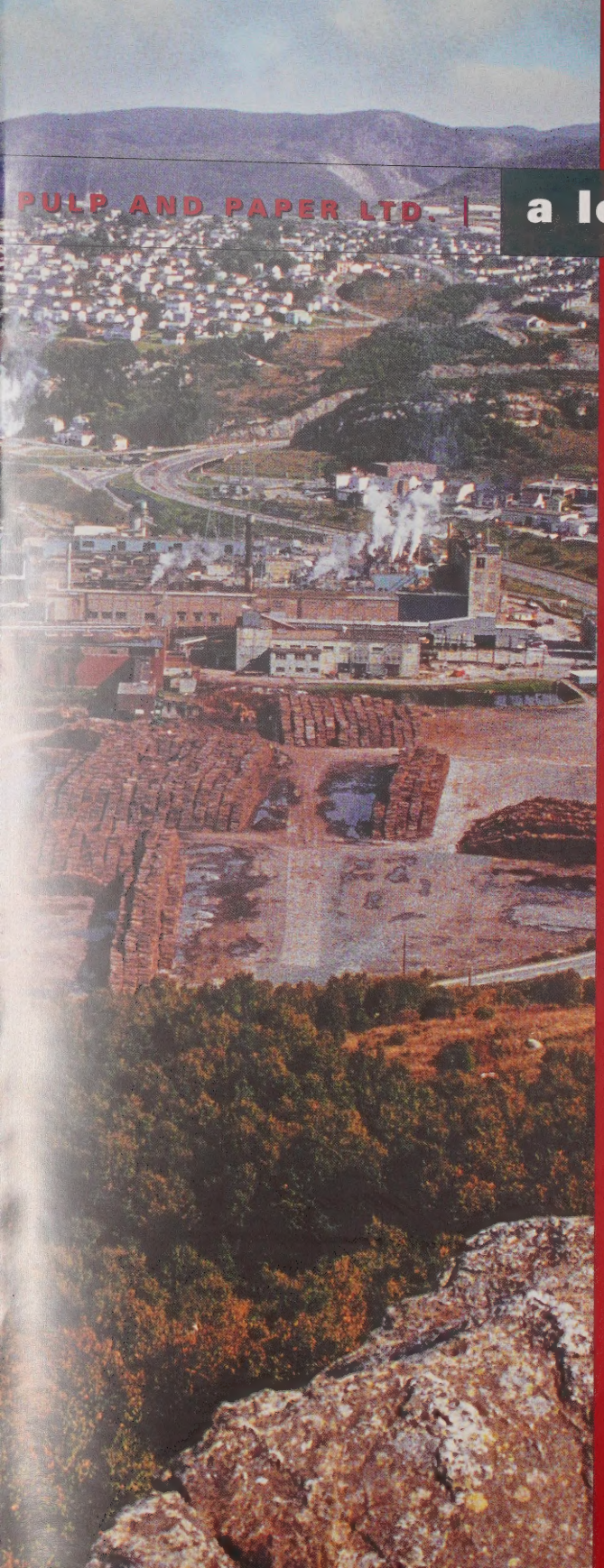
investment brings major emission reductions

State-of-the-art technology, including a recently installed $160-million Kivcet flash smelting process, has enabled Cominco to improve its energy efficiency and cut its greenhouse gas emissions. The new lead smelter has reduced particulate emissions by 95%, metal emissions by 75% to 90% and sulphur dioxide emissions by 75%. Moreover, an ISO 14001-based management system being implemented promises to further improve environmental performance at the Trail facility.

Since its 1989 base year, the facility has achieved a total greenhouse gas reduction of 40%, a 26% drop in carbon energy consumption per tonne of production, and a one-third reduction in carbon dioxide produced per tonne of output. Significantly, these gains were accompanied by reduced operating costs.

In addition, by collecting and marketing the by-products of its pollution abatement efforts, the company has opened a new revenue stream that is making its environmental program even more cost-effective.


Energy efficiency makes | CORNER BRO



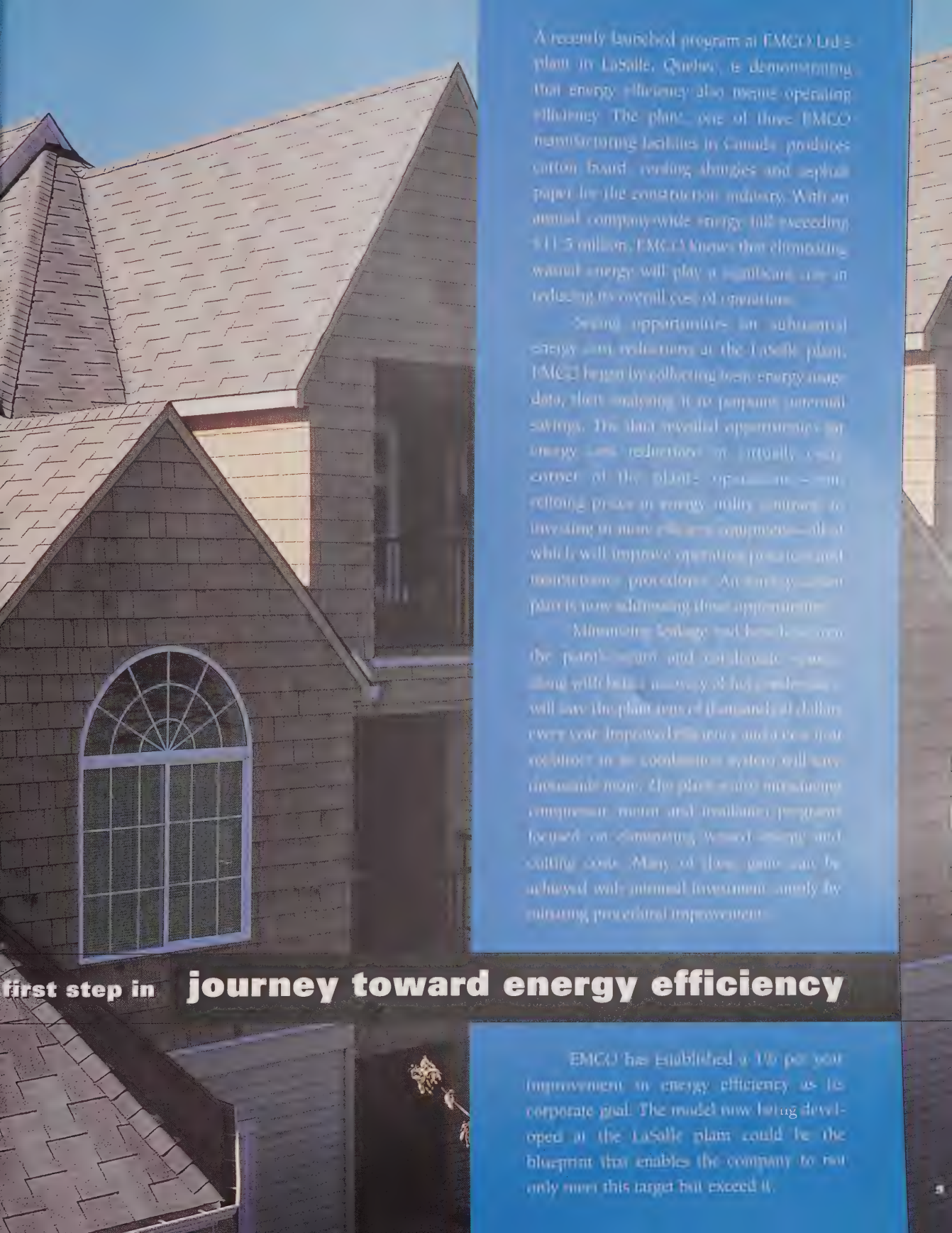
Corner Brook Pulp and Paper Ltd. has demonstrated convincingly that cost reductions and energy efficiency go hand in hand.

a low-cost producer

In 1991, responding to the need to become a low-cost, high-quality producer, the Newfoundland forest products company made thermal energy conservation the top priority in its operations. With the strong commitment of mill management, the company launched an energy efficiency program supported by an awareness campaign to involve all employees in the hunt for energy savings.

The company identified and made easy-to-achieve changes first, then implemented an ongoing program to squeeze all the waste it could from its operations. Monthly energy reports provided the benchmarks to measure progress. The results have been impressive. From 1991 to early 1999, Corner Brook Pulp and Paper saved over $35 million in Bunker "C" oil alone.

Corner Brook Pulp and Paper has transformed itself from one of the industry's highest cost mills to one of the lowest, while at the same time improving the quality of its newsprint. It achieved this metamorphosis by making energy efficiency a major source of cost savings.



first step in journey toward energy efficiency

A recently launched program at EMCO Ltd.'s plant in LaSalle, Quebec, is demonstrating that energy efficiency also means operating efficiency. The plant, one of three EMCO manufacturing facilities in Canada, produces cotton board, roofing shingles and asphalt paper for the construction industry. With an annual company-wide energy bill exceeding $11.5 million, EMCO knows that eliminating wasted energy will play a significant role in reducing its overall cost of operations.

Seeing opportunities for substantial energy cost reductions at the LaSalle plant, EMCO began by collecting basic energy usage data, then analyzing it to pinpoint potential savings. The data revealed opportunities for energy cost reductions in virtually every corner of the plant's operations – from refining practices in energy utility systems to investing in more efficient equipment – all of which will improve operating practices and maintenance procedures. An energy action plan is now addressing these opportunities.

Minimizing leakage and heat loss from the plant's steam and condensate system, along with better recovery of hot condensate, will save the plant tens of thousands of dollars every year. Improved insulation and a new heat recovery to air conditioning system will save thousands more. The plant is also introducing compressor room and insulation programs focused on conserving wasted energy and cutting costs. Many of these gains can be achieved with minimal investment, mostly by initiating procedural improvements.

EMCO has established a 3% per year improvement in energy efficiency as its corporate goal. The model now being developed at the LaSalle plant could be the blueprint that enables the company to not only meet this target but exceed it.


| LABATT BREWERIES OF CANADA |

An audit of its powerhouse equipment and utility distribution systems in the early 1990s led Labatt Breweries of Canada to launch vigorous energy and water efficiency programs. The company sought to cut its production costs and at the same time reduce greenhouse gas emissions.

Beginning in 1992, Labatt launched an awareness campaign designed to help brewery employees understand the importance of energy efficiency and to encourage their participation in energy conservation programs. The company also began investing capital in the expansion of its network of flow meters, enabling breweries to measure power and water usage rates by department and even by machine. Labatt is following this program with the installation of utility monitoring and targeting software in all of its breweries.

The combination of management focus, employee participation and new equipment has paid significant dividends. Since 1991, the amount of water required to produce one hectolitre of beer has dropped from 13.3 to 9.5 hL, while fuel and electricity usage has decreased from 2943 MJ/hL to 2277 MJ/hL. Even excluding the reduction in effluent surcharges, savings generated by the program amount to $5.5 million annually.

loyee participation: the key to energy efficiency

Friendly competition among Labatt's breweries continues to foster further energy efficiency gains. By identifying one brewery in the facility with the "best practices," other breweries are encouraged to catch up, leading to a cycle of continuous improvement in energy efficiency across the company.


LAFARGE CANADA INC.

Thanks to a comprehensive company-wide program, Lafarge Canada Inc. has made impressive gains in energy efficiency. Now, thanks to a $140-million investment at its plant in Richmond, B.C., the world's second largest producer of cement will significantly enhance those gains.

kiln technology slashes energy consumption

Lafarge replaced older, wet slurry "long" kilns with a modern, dry-process "short" kiln at the 40-year-old B.C. plant. In the wet slurry process, water is mixed with raw material to homogenize the mix and simplify material movement. This water must be evaporated during the manufacturing process, and is a major energy drain. Short dry kilns can operate at substantially less fuel per tonne of product than wet kilns because this energy-consuming step is not required. In addition, these kilns are equipped with higher efficiency heat exchange systems.

The results of the conversion are dramatic. The new kiln has cut energy consumption per tonne of product in half while substantially reducing regulated gas emissions. For example, SO_x and NO_x emissions are projected to decline by more than 25% and particulate emissions will fall by more than 40%. Lafarge expects that actual experience will prove these estimates to be conservative, with overall emissions actually declining despite the doubling of production.

In addition, by converting from a wet to a dry process, the company has reduced its water usage by millions of litres per year, further minimizing its impact on the environment.

An intensive effort to reduce its cost of operations has steered century-old Lethbridge Iron Works down an energy efficiency path.

...oosts energy and manufacturing efficiency

Photo credit: Lorne Kemmet Photography

[illegible] Alberta foundry to introduce efficiency measures throughout the manufacturing process. The company replaced its 70-year-old indirect arc furnaces with modern energy-efficient [illegible] induction furnaces [illegible] reduced electrical power consumption. [illegible] all process equipment [illegible] programmable logic controllers which automatically [illegible] [illegible] only when production is underway. The company also [illegible] power [illegible] belt and [illegible].

[illegible] 10°C. Old heating equipment was scrapped and replaced with modern, energy-efficient furnaces and heating units. Incandescent lighting was removed and high-efficiency compact flourescent systems were installed.

There is no doubt that aggressive energy efficiency efforts have enabled Lethbridge Iron Works to achieve substantial cost savings. With an ongoing program that builds energy efficiency into the equipment selection equation, the company will continue to add to its gains well into the future.


MapleLodge
FARMS

gains control of

refrigeration energy costs

Maple Lodge Farms Ltd. faced a significant challenge. Canada's largest independent chicken processor needed to replace three independent systems with a sophisticated new control system for its refrigeration compressors without shutting down the plant or disrupting production. The results have been spectacular.

The company began by installing a Hench Controller Module from DML Control Inc. in Guelph, Ontario, for the plant's 2,900-hp refrigeration compressors. Incorporating an advanced sequencing strategy, the new module computes millions of possible permutations and automatically establishes the most efficient operating configuration. By taking advantage of inherent efficiencies available through the laws of refrigeration and the individual equipment at the site, the Hench system delivers more accurate pressure control and maximum operating efficiency.

Improvements were obvious from the first day of operation, as the company recorded an immediate 20% improvement in compressor efficiency. But that was just the beginning of the savings. Increased suction pressure has led to further annual compressor energy reductions of 8%. In addition, the system's sophisticated automatic sequencing control enables one or two compressors to handle loads previously carried by three, providing the plant with a total of 20% to 40% savings in annual compressor operating requirements.

Maple Lodge Farms estimates that its fully installed refrigeration control system paid for itself in energy savings within the first year, leading the firm to multiply its savings by installing additional Hench Controller Modules on its condensers and air compressors.


| NRI INDUSTRIES INC. | Investment slashes
emi

Each year, about 300 million automotive tires are discarded in North America, a massive disposal problem that NRI Industries Inc. has turned into a recycling opportunity.

ions and energy consumption at two plants

Although it is already processing a significant portion of the continent's annual tire waste, the company recently installed a continuous tire press to increase its processing capacity by nearly 50%. NRI also invested in programs to make its two Toronto facilities cleaner and more energy-efficient.

NRI installed new, high-efficiency boilers at its plants, significantly reducing both fuel consumption and the production of waste gases such as nitrous oxide, carbon monoxide and carbon dioxide. The boilers alone have slashed natural gas use by 43.4% at one plant and by 27.2% at the other. At its Cawthra plant, NRI has installed electrostatic precipitators in the exhaust system, enabling the facility to collect 97% of particulate emissions from its various manufacturing processes.

NRI Industries continues to introduce new solutions from old rubber. The innovative technologies it has developed and the investments it has made represent an economically sound and environmentally responsible solution to a major environmental problem.


OWENS CORNING CANADA
Carrying the
energ
OWEN
CORNIN

As a manufacturer of insulation for home, mechanical and commercial applications, Owens Corning Canada is intimately involved

efficiency message to future generations

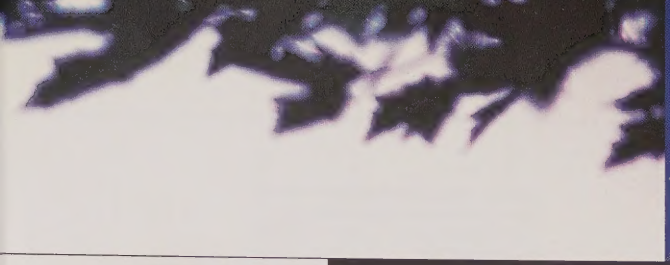
in energy conservation. By helping to minimize heat loss, the company's products have enabled customers across Canada to reduce their energy consumption. In addition, Owens Corning continues to improve the energy efficiency of the facilities and processes that make up its own operations.

But one of the company's most significant contributions to the future of energy efficiency lies in a program it has sponsored for the past 20 years in conjunction with Lester B. Pearson Collegiate. Each year, dozens of grade nine geography students participate in a contest that awards prizes to the top eight submissions with an energy theme. Winning projects are generally outstanding, and the 1999 winners are no exception. An intricately detailed scale model home demonstrating energy leak points, and a dazzling working wind power model took this years top prizes.

Winning entries are mounted in the lobby at Owens Cornings Scarborough plant, a display that never fails to attract the attention and respect of plant staff and visitors alike.

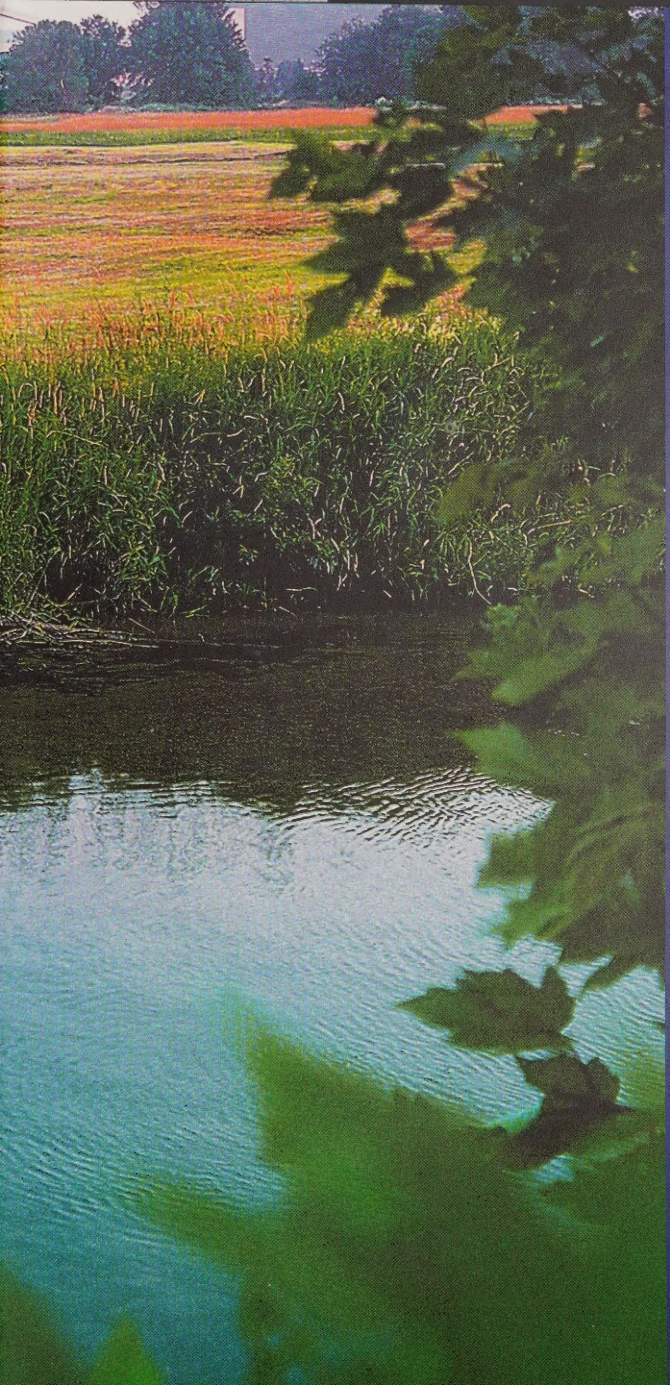
By encouraging students to focus their attention on energy and rewarding them for the creativity and hard work they apply to their projects, Owens Corning is helping to make energy a top-of-mind concern for future generations of leaders.


New Brunswick Division of the | POTASH CORPORATION OF SASKATCHEWAN



Producing potash takes large quantities of steam—steam to recover potash from dissolver tanks and more steam to operate the evaporator that is essential to the process. Making this steam takes a great deal of energy.

C. | saves big by investing in energy efficiency



By recovering and reusing heat from its crystallizers, the New Brunswick Division of the Potash Corporation of Saskatchewan Inc. has substantially improved its energy efficiency. The Division launched a two-year, two-phase energy efficiency improvement project in 1998. The facility reduced the load on its cooling tower circulation loop by adding a shell and tube heat exchanger, enabling its potash mill to recover more of the energy contained in the cooling system's vapours. To achieve additional energy gains, improvements, modifications and investments were made throughout the process.

Although the project is still underway, the gains already achieved are impressive. Energy consumption per unit of output has dropped 30%. The project's success has enabled the mill to boost its recovery to 90% from a previous 86%, reduce its unit costs and produce an additional 43,000 tonnes of white murite.

The New Brunswick Division estimates a capital investment payback period of just two years, demonstrating once again that improving energy efficiency not only provides environmental benefits, it makes good business sense.

Aluminum

Alcan Smelters and Chemicals Ltd.
Aluminerie Alouette inc.
Aluminerie de Bécancour inc.
Aluminerie Lauralco inc.
Société Canadienne de Métaux Reynolds, Limitée

Cement

ESSROC Canada Inc.
Inland Cement Limited
Lafarge Canada Inc.
North Star Cement Limited
St. Lawrence Cement Inc.
Tilbury Cement Limited

Chemicals

Celanese Canada Inc
Chinook Group – Sombra Plant
DuPont Canada Inc.
Elementis Pigments Canada
MDS Nordion Inc.
Nacan Products Limited
Synergistics Industries Limited

Electrical/Electronics

Ascolectric Ltd.
Broan Limited
Honeywell Limited
IBM Canada Ltd.
Nortel (Northern Telecom Limited)
Osram Sylvania Ltd.
Vansco Electronics Ltd.

Food and Beverage

Andrés Wines Ltd.
Casco Inc.
Coca-Cola Beverages Ltd.
Cuddy Food Products
Garden Province Meats Inc.
H.J. Heinz Company of Canada Ltd.
Hub Meat Packers Ltd. – Sunrise Brand
Kraft Canada Inc.
Labatt Breweries of Canada
Maple Leaf Meats
Maple Leaf Pork
Maple Lodge Farms Ltd.
Molson Breweries
Moosehead Breweries Ltd.
Pepsi-Cola Canada Beverages
Sleeman Brewing and Malting Co. Ltd.
Sun-Rype Products Ltd.
Versacold Corporation

General Manufacturing

3M Canada Inc.
ABCO Property Management Inc.
Canadian Uniform Limited
Champion Feed Services Ltd.
Coyle & Greer Awards Canada Ltd.
Crown Cork & Seal Canada Inc.
Envirogard Products Ltd.
Escalator Handrail Company Inc.
Euclid-Hitachi Heavy Equipment Ltd.
Federated Co-operatives Ltd.
Fibrex Insulations, Inc.
Garland Commercial Ranges Limited
Gould Shawmut Company
Greif Containers Inc.
Huls Canada Inc.
Imperial Home Decor Group Canada Inc.
Imperial Tobacco Limited
Interface Flooring Systems (Canada) Inc.
International Paper Industries Limited
Jones Packaging Inc.
Kindred Industries
Kodak Canada Inc.
LePage (Division of Henkel Canada Limited)
Maksteel Inc. (Division of Makago Industries Ltd.)
Marcel Lauzon Inc.
Meridian Clemmer Industries Ltd.
Metroland Printing, Publishing & Distributing Ltd.
Morton International Ltd.
Polytainers Inc.
PRO-ECO Limited
Regent Eco Canada
Scapa Tapes North America
S.C. Johnsons & Sons, Limited (Johnson Wax)
Simmons Canada Inc.
Starcan Corporation
Superior Radiant Products Ltd.
Tamrock Canada Ltd.
Tamrock Loaders Inc.
Teknion Furniture Systems
The Source Medical
VicWest Steel
Viskase Canada Inc.
Wabash Alloys Ontario
Wescast Industries Inc.
Wyeth-Ayerst Canada Inc.

Lime

Chemical Lime Company of Canada Inc.
Continental Lime Ltd.
Global Stone (Ingersoll) Ltd.
Graybec Calcium Inc.
Havelock Lime (Division of Goldcorp. Inc.)

Mining

Aur Resources Inc.
BHP Diamonds Inc.
Brunswick Mining Division
(Brunswick Mining and Smelting Corporation Limited)
Brunswick Smelting and Fertilizer Division
(Brunswick Mining and Smelting Corporation Limited)
Cominco Ltd.
Echo Bay Mines Ltd. – Lupin Operation
Falconbridge Limited
Fonderie Horne – Métallurgie Noranda inc.
Hemlo Gold Mines Inc., Golden Giant Mine
Hillsborough Resources Limited
Hudson Bay Mining & Smelting Co., Ltd.
INCO Limited
International Minerals and Chemicals
(Canada) Global Limited
(IMC Kalium Canada Ltd.)
Iron Ore Company of Canada
La Mine Doyon (Barrick Gold Corporation – Cambior Inc.)
Mines et exploration Noranda inc. – Division Matagami
Mines Wabush (gérées par la Compagnie Minière Cliffs inc.)
Noranda Metallurgy Inc. (Canadian Copper Refinery)
Placer Dome Canada Limited
Quebec Cartier Mining Company
Syncrude Canada Ltd.
Teck Corporation
Westmin Resources Limited
Zinc Électrolytique du Canada Limitée/Canadian Electrolytic
Zinc Limited

Petroleum Products

Amoco Canada Petroleum Company Limited
Canadian Tire Petroleum
Chevron Canada Limited – Burnaby Refinery
Husky Oil Operations Ltd.

Imperial Oil Limited
Interprovincial Pipe Line Inc.
Irving Oil Limited
Nova Corporation
Parkland Refining Ltd.
Petro-Canada
Safety-Kleen
Shell Canada Products Limited
Suncor Energy Inc. – Sunoco Group
Ultramar Ltd. – Saint-Romuald Refinery

Plastics

Downeast Plastics Ltd.
Husky Injection Molding Systems Ltd.

Potash

Potash Corporation of Saskatchewan Inc.
- Allan Division
- Cory Division
- Lanigan Division
- New Brunswick Division
- Patience Lake Division
- Rocanville Division

Pulp and Paper

Abitibi-Consolidated Inc.
Avenor Inc.
Canfor Corporation
Cariboo Pulp and Paper Company Limited
Corner Brook Pulp and Paper Ltd.
Daishowa Inc.
Donohue Inc. (QUNO Inc.)
E.B. Eddy Forest Products Ltd.
Eurocan Pulp and Paper Company Limited
F.F. Soucy Inc.
Fletcher Challenge Canada Ltd.
Fort James-Marathon, Ltd.
James Maclaren Industries Inc.
Kruger Inc.
Lake Utopia Paper
MacMillan Bloedel Limited
Maritime Paper Products Limited
Nexfor Inc.
Paperboard Industries International Inc.
(Division of Cascades Inc.)
Repap Enterprises International Inc.
Riverside Forest Products Limited
Spruce Falls Inc.
St. Marys Paper Ltd.
Stora Forest Industries Limited
Tembec Inc.
Weldwood of Canada Limited
West Fraser Timber Co. Ltd.
Weyerhaeuser Canada Ltd.

Rubber

Gates Canada Inc.
Michelin North America (Canada) Inc.
NRI Industries Inc.

Steel

Algoma Steel Inc.
AltaSteel Ltd.
Atlas Specialty Steels
CHT Steel Company
Co-Steel LASCO
Dofasco Inc.
Denim Swift
Frost Wire Products Ltd.
Gerdau Courtice Steel Inc.
Hilton Works (Division of Stelco Inc.)
Ivaco Inc. (Ivaco Rolling Mills)
Lake Erie Steel Company Ltd.
Laurel Steel (Division of Harris Steel Limited)
Lethbridge Iron Works
QIT – Fer et Titane Inc.
Slater Steels Inc. – HSB Division
Stelco Fasteners Ltd.
Stelco Inc.
Stelco-McMaster Ltée
Stelfil Ltée
Stelpipe Ltd.
Stelwire Ltd.
Sydney Steel Corporation
Welland Pipe Ltd.

Textiles

Agmont Inc.
Albarrie Canada Limited
Barrday Inc.
Britex Group (The)
Cambridge Towel Corporation (The)
Canada Cordage Inc.
Canada Hair Cloth Company Limited
Cavalier Textiles
Coats Bell
Coats Patons
Collingwood Fabrics Inc.
Collins & Aikman Canada Inc.
Consoltex Inc.
Cookshire Tex
Denim Swift
Dominion Textiles Inc.
Fabrene Inc.
Glendale Yarns Inc.
J.L. de Ball Canada Inc.
LaGran Canada Inc.
Lincoln Fabrics Ltd.
Nova Scotia Textiles, Limited
Peerless Carpets/La corporation des tapis Peerless
Spinrite Inc.
Stewart Group Ltd. (The)
St. Lawrence Corporation
Union Felt Products Inc.
Vagden Mills Limited
Velcro Canada Inc.
Vitafoam Products Canada Ltd.
VOA Colfab Inc.

Transportation Manufacturing

Accuride Canada Inc.
AlliedSignal Aerospace Canada Inc.
Altek Automotive Castings
Bombardier Inc.
Cami Automotive Inc.
Canadian General-Tower Limited
DaimlerChrysler Canada
Eaton Corporation – Suspension Division
Ford Motor Company of Canada, Limited
Freightliner of Canada Ltd.
General Motors of Canada Limited
Kelsey Hayes Canada Ltd.
Magna Corporation – Cosma Body & Chassis Systems
McDonnell Douglas Boeing Canada Ltd.
Navistar International Corporation Canada
Oetiker Limited
Orenda Aerospace Corporation
Orion Bus Industries
Polywheels Manufacturing Limited
Pratt & Whitney Canada Inc.
Prévost Car Inc.
Rockwell International
Russel Metals Inc.
Toyota Motor Manufacturing Canada Inc.
Volvo Canada Ltd.
Woodbridge Group (The)

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